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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF
(SR-6J)

May 9, 2001

Mr. D. Michael Light
Manager, Remedial Projects
Solutia, Inc.
P.O. Box 66760
St. Louis, Missouri 63166-6760

RE: Comments on Revised Human Health and Ecological Risk Assessments
Sauget Area 1 Site, Sauget and Cahokia, Illinois

Dear Mr. Light:

A review of Solutia's March 30, 2001, submittal of the Responses to U.S. EPA Comments on the Human Health Risk Assessment and the Ecological Risk Assessment for the Sauget Area 1 Site has been conducted by the U.S. Environmental Protection Agency (U.S. EPA) as well as the U.S. Army Corps of Engineers (and their contractor Weston, Inc.) and Illinois EPA. Solutia's responses and proposed changes to the human health risk assessment has significantly improved this document and, with only a few minor changes to this document, it will be approvable. The ecological risk assessment requires further changes and clarification in accordance with the comments attached before U.S. EPA can consider it to be approvable. Please re-submit the revised assessments on or before June 1, 2001.

If you have any questions regarding the attached comments please do not hesitate to contact me at 312/886-4663.

Sincerely,

Michael McAteer
Remedial Project Manager

cc: Thomas Martin, USEPA
Tim Gouger, USACE
Candy Morin, IEPA
Kevin de la Bruere, USFWS
Michael Henry, IDNR

sgf1_hhra2 comments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

COMMENT ON REVISED HUMAN HEALTH RISK ASSESSMENT
SAUGET AREA 1 SITE

- Page T-9: Under the Conclusions Section the last paragraph should be deleted. It is not appropriate to first describe the risks to human health and then describe an upgrade in PPE as the method for protecting workers' health. This approach appears to dismiss all other options for managing the risks to human health posed by the contamination at Sites G, H, I, and L.

U.S. Army Corps of Engineers
Omaha District

May 3, 2001

Michael McAteer
US Environmental Protection Agency, Region V
Superfund Program
77 West Jackson Blvd
Chicago, IL 60604

Mr. McAteer,

As requested, the U.S. Army Corps of Engineers and our Contractor, Roy F. Weston Inc, have finished reviewing the "Response to Comments March 2001" for Sauget Area 1 –Human Health Risk Assessment and the Ecological Risk Assessment. While USACE concurs with most responses to the Human Health Risk Assessment, a couple of concerns remain. First, the construction worker exposure to leachate scenario was based upon TCLP leachate analyses rather than based upon total leachate analyses, which is provided in the Leachate Treatability Test. As such, the hazard quotient for the construction worker exposure to leachate scenario was less than one for Sites G, H, and I. Second, dioxin and PCB contamination were reported in the surficial samples of the waste fill areas though "clean" fill was reportedly placed over them. Solutia Inc needs to justify the presence of surficial soil contamination given the reportedly "clean" air monitoring results.

Our review of the response to comments on the Ecological Risk Assessment identifies numerous areas which were unsatisfactorily addressed. Considerable effort is needed to address the attached comments and develop a defensible document.

If you have any questions or comments, please call me at (402) 293-2514.

Sincerely

Timothy P. Gouger, PE
USACE Rapid Response
Project Manager

sqfl_Risk2_Corps_Comments

USACE COMMENTS

WESTON COMMENTS

Weston Review of
Solutia, Inc.
Sauget Area 1 Ecological Risk Assessment Responses Comments
Menzie-Cura & Associates, Inc.
March 2001

Roy F. Weston Inc (WESTON) was retained by the Army Corps of Engineers (ACOE) and the US Environmental Protection Agency (USEPA) to review and provide comments on the *Sauget Area 1 Ecological Health Risk Assessment Response to Comments* prepared by Menzie-Cura (March 2001).

Comments on responses are presented by original comment number below. Note that responses to Weston Comments were each commented on; but that comments on responses to other commentors issues were not presented unless we had a question or issue relating to that response. While the effort to provide the original text with the places for new inserts is appreciated; a recommendation for approval of this document cannot be given until the text is reviewed as a whole. At that time, there may be additional comments generated. This document was difficult to review, particularly since the entire original risk assessment was not provided, it was necessary to look at not only the responses, the insert locations, and revised text, but also the original risk assessment document to get a picture of whole sections. Also, it was not noted in the "insert locations" where "revised text" was to be added. That being said, there are still some significant flaws in the report as noted in the review below. In addition, the conclusions of this report were, in general, not reviewed given that issues with the reference areas, data groupings, exposure assumptions, and BAFs must be corrected.

USEPA Region 5
Ecological Risk Assessment

Comment 2: Response is tangential. In addition, although the habitat and morphology of Dead Creek Section F are different from Borrow Pit Lake (BPL) and the upper portions of Dead Creek, CS-F provides better fish habitat than the upper portions of the creek. The answer given still does not explain why no fish were present. Also, what was the water level? How does that compare to the water levels during other parts of the year?

Weston Comments

General Comment 2: Added text (1.3 Organization of the Report) does not sufficiently explain how the report is different. The bulleted items are virtually useless, with associated text essentially mimicking the titles provided. Specific instances where confusion may result were given in the original comment. These instances were not even called out as examples in the new text.

General Comment 3: This comment covers responses given to Weston General Comment 3 and Specific Comments 3 and 4.

The basis for the original consideration of these areas for reference is still not given. Nor is there a good explanation why these areas were selected as reference. Details belong in the ERA. Please add or if sufficient detail is given within the Field Sampling Report (O'Brien and Gere, 2000), attach that as an appendix. Almost all selection criteria listed are de facto. It is inferred from the text that no reference area was selected with the lower part of CS-F in mind. Reference areas were supposed to be selected based on two stream flow characteristics – creek and lake. As CS-F is part of the creek, a reference area for that habitat was supposed to have been evaluated. It is a real stretch to retro-fit a reference area. Saying that reference area 2-1 is similar to CS-F because both traverse an agricultural area is not appropriate; particularly since the habitat assessment found in new text Section 7.2.1, page 6, paragraph 2, sentence 5 says of reference area 2-1 "This section was similar to Dead Creek sectors B through E in that it was shallow and muddy. It was also similar to these areas (but not Creek Sector F) in that it had a road crossing and agricultural fields coming down to the waters edge." Better to indicate that there is not a comparable reference area available than to make such a weak argument. "Important characteristics" are listed for which the reference areas and BPL and CS-F are similar. The characteristics for which the site areas are similar to the reference areas may not be as important as characteristics such as stream cover and surrounding land use – both of which are different for the areas in question.

Text states for reference area 2 that "It was not possible to obtain permission to sample the second reference area..." If this is truly the case, why are there benthic community, toxicity testing, and chemistry samples from reference area 2?

In Table 2-1, the range and number of samples as well as the average should be presented for the parameters. Although additional/other statistics would be better to use to determine comparability, the average shows that BPL had a pH of 9.07, whereas the highest pH in a reference area was 8.1. An order of magnitude difference in pH is not comparable. Why is there no data from Ref 1-2? Table 2-1 footnotes that "Habitat Assessment Field Data Sheets" were completed for each creek section and reference areas. This would be good information to have in the risk assessment to determine reference area appropriateness.

Given the information regarding Ref 2-1, it is inappropriate to use Ref 2-1 data for comparisons to CS-F and BPL. In addition, it is still not clear if Ref 1-1, 1-2, or 2-2 is appropriate for either BPL or CS-F or that it is appropriate to combine data from these areas when making comparisons.

General Comment 4: No comment on response necessary.

General Comment 5: Although discussion has been added calling out which detection limits were greater than benchmarks, discussion on whether data quality objectives (DQOs) were met is still not presented. Did these data meet the DQOs set forth in the

QAPP? If not, why not and are the data still useable? DQOs cover more than just detection limits.

Section 5.1.5 Sediment: There are at least two chemicals missing from the discussion.

Table C-2.12: Except for pentachlorobiphenyl, the detection limits for PCB homologs are approximately 3 to 20 times higher than the detection limits for PCBs. By what method were PCB concentrations determined?

General Comment 6: Response acceptable.

General Comment 7: Response to Dead Creek water levels is acceptable. However, it leads to the question of why the samples were taken during the low or no-flow period.

General Comment 8: Response acceptable.

General Comment 9: Do not agree with new text. Believe that the habitat in the reference area may not be comparable to that in CS-F and BPL. In fact, the habitat on-site seems better than in the reference area; therefore, do not agree that the benthic community is less impaired than the reference area.

General Comment 10: New text in Section 4 is not specific enough. Each measure needs to have a weight given to it and a clear explanation as to why that weight was given. It is not enough to say that "Actual field measurements have been given a medium to high weight because they represent quantifiable conditions at the site." Which measurement endpoints based on field measurements warrant a "medium" and which warrant a "high"? And why?

In the new text in Section 8.0: page 1 referring to "some potential for adverse effects on fish due to mercury at the site" is "these measures of exposure are given medium weight... because they measure actual field conditions." And page 2, 1st paragraph, referring to "...concentrations of COPCs in surface water do not pose a risk to fish in the Borrow Pit Lake at levels above those that exist in reference areas" is "These measurements were given a high weight because they measure actual field conditions." It is curious that a supposed field measurement being interpreted as "no risk" is given a higher weight than a field measurement interpreted as having the potential for adverse effects.

Table 8-1 is still very confusing. Measures of exposure are listed as lines of evidence, endpoints that are listed as literature values on this table are referred to as field observations in text. In addition, species habitat use is listed as a line of evidence. This is not appropriate. Please refer to original specific comment #36.

Specific Comment 1: Response insufficient. Text provided is a good start; however, the requested information regarding the facility operations and the contaminants expected still needs to be provided.

Specific Comment 2: Insert l, gives length of entire CS-F. Would be helpful to know the length of the portion being evaluated in this assessment. Insert M, gives the area of BPL; given the shape of the lake, it would also be helpful to know the length and width.

Specific Comment 3: Please see response to Weston General Comment 3.

Specific Comment 4: Please see response to Weston General Comment 3.

Specific Comment 5: Response acceptable.

Specific Comment 6: Added maps are acceptable. However, the lack of information known from which to develop habitat maps for the reference areas is disconcerting.

Specific Comment 7: It is not sufficient to say that the source of contamination in CS-F and BPL is the upstream portions of Dead Creek. What is the original source of the contamination? In addition, this section deals with the aquatic environment only. Text regarding the terrestrial component needs to be added.

Specific Comment 8: Please indicate when observations of muskrat tracks and dens were made.

Specific Comment 9: Response acceptable.

Specific Comment 10: Response acceptable.

Specific Comment 11: Response acceptable.

Specific Comment 12: Footnotes #1 and #3 are switched.

Specific Comment 13: Response acceptable.

Specific Comment 14: Unless analytical methods differ, all sediment data (i.e., "surficial sediment samples" and "industry specific") collected from 0 to 6 inches should be combined to develop summary statistics and EPCs for the ERA. Text in 5.1.1 indicates that 47 industry-specific samples were collected. Tables in Appendix C (C-2.9 and C-2.10) show only 37 samples. In addition, all sediment samples being used in the ERA should be shown on one map (i.e., combine Figures 5-2 and 5-3).

Figure 5-5 needs to have the background sample designations called out in the legend and needs to show the samples being used from Sites G, H, I, L, and N. If this would make Figure 5-5 too busy, suggest showing the Sites and their respective sampling locations on separate figures. Please justify why these soil background concentrations are appropriate.

It is inappropriate to calculate UCLs and run normality tests with data groupings with 3 and 4 samples. In addition, and this refers to all of the data, the human health risk

assessment used the maximum whenever the sample size was less than 8. Was this done in the ecological risk assessment? If not, why not? Data treatment should be consistent between the reports, unless a there is a good reason for it not to be.

Specific Comment 15: The point that since the terrestrial evaluation is screening only and that if risks are observed it might be necessary to do more work (e.g., move to baseline ERA) is not addressed. Insert q – COPCs were also selected for biota. Although justification as to why clams and shrimp were not collected from CS-F is provided in the response, it is still missing from text.

Specific Comment 16: Response acceptable.

Specific Comment 17: Response acceptable.

Specific Comment 18: Analyses for fluoride and phosphates were specifically requested since they were on a list of known constituents used/disposed of on-site. While it is appreciated that fluoride was added to the COPC list, an effort should be made to evaluate these constituents.

Specific Comment 19: New text in 5.1.4 states that ethylbenzene was not detected in upstream surface water (Sectors B, D, and E) samples. Was it detected in CS-C?

Specific Comment 20: Response acceptable.

Specific Comment 21: Some of the calculations for Total PAHs are incorrect.

Specific Comment 22: Please provide information on fish lengths. In looking at Table 5-1, it was noted that FFREF2 COMP-02 is made up of three different species. Composites should consist of one species only. This data point should not be used.

Specific Comment 23: How were estimated values (e.g., J values) handled? What flags were considered to be non-detects? Please provide more detail regarding the treatment of samples where one-half the non-detect exceeded the maximum. Was this sample thrown out entirely, or was it used to calculate the frequency of detection? In the average calculation, was the number of samples reduced? In areas/media for which insufficient total number of samples were available to calculate a UCL and the maximum concentration was the default exposure concentration, the elimination of that type of sample would have no bearing on results. However, in the case of floodplain soil, where there are many samples and a UCL could be calculated, the elimination of a sample could have an effect. For which areas/media/chemicals was the elimination done?

Specific Comment 24: Response acceptable.

Specific Comment 25: Response acceptable.

Specific Comment 26: Response acceptable.

Specific Comment 27: Response acceptable.

Specific Comment 28: Response acceptable.

Specific Comment 29: National Recommended Water Quality Criteria. In Table 5-2 it still appears as though the dissolved criteria, not criteria adjusted to total recoverable, are presented. Also, the text states that "where appropriate, the criteria were adjusted to the average water hardness of the water body." A Table 5-2 footnote indicates that the lowest hardness on site was used, not the average. Please correct.

Specific Comment 30: Response acceptable.

Specific Comment 31: Action not acceptable. Response indicates that some of the fish were collected in areas where there are active fish advisories. It seems incorrect to then state in the text that obvious high biases were excluded.

Specific Comment 32: Response acceptable.

Specific Comment 33: Since it is inappropriate to compare the site to the reference area surface water because of differential in TSS, this applies throughout report. Comparisons of surface water to reference need to be removed from the entire report (i.e., Table 5-2 and any other places the comparison is made.
Specific Comment 34: Response does not address whether or not the chemical analysis of sediment used in the toxicity tests was performed. If analyses were not done, it is a major impediment to interpretation of results.

Specific Comment 35: Response acceptable.

Specific Comment 36: Response acceptable.

Specific Comment 37: Response insufficient. What were the results from the earlier (1996) field work and the more recent habitat characterizations? It is disturbing that in the first ecological work plan submitted (which was written after the 1996 field trip) suggested plant sampling, yet now it is asserted that no vegetation is present in BPL.

Specific Comment 38: Response acceptable.

Specific Comment 39: Response acceptable.

Specific Comment 40: Response acceptable.

Specific Comment 41: Am not sure I agree with this explanation. Would like to see other issues corrected, e.g., fact that some of the reference areas are not appropriate for use, prior to buying off on this one.

Specific Comment 42: Response acceptable.

Specific Comment 43: Response acceptable.

Specific Comment 44: Response acceptable.

Specific Comment 45: Response acceptable.

Specific Comment 46: Response acceptable.

Specific Comment 47: Response seems to conflict with the proposed revised text. In addition, for insert aa: EPA guidance states that the EPC should be the lesser of the UCL or the maximum detected concentration. Although the UCL is a representation of an average, it is not the same as the mean concentration. Given that a straight mean, not a spatial average, was calculated, the use of the "average" concentration is not consistent with EPA guidance, and; therefore, unacceptable.

Specific Comment 48: Based on information provided in Tables 4-1 and 4-2 of USEPA, 1993, disagree with the % moistures assumed; and therefore with the calculated food ingestion rates. This also may affect the incidental sediment ingestion rate estimation for other receptors.

Specific Comment 49: The citation for the moisture content in fish is not presented on page 3, please add. In addition, if as stated in both the old and the new text that the sediment ingestion rate is calculated based on a 100% fish diet, disagree with the 80% moisture content assumption.

Specific Comment 50: Response acceptable.

Specific Comment 51: Response acceptable.

IEPA Comments

Comment 11: The response regarding the use of the Federal and State Endangered Species Acts as ARARs in the Feasibility Study is unacceptable. Neither of the risk assessments has been approved and it is premature and entirely inappropriate at this point to state that there are "no human health or ecological risks requiring remediation" in the BPL or CS-F. Believe that CS-F was not even evaluated for human health risks. In addition, the endangered species acts would be ARARs for the upper creek segments and the terrestrial areas of the site already targeted for removal and remediation.

USFWS Comments

Comments 4 and 10: Response not acceptable. Believe the request was to evaluate insectivores. Did not do that. Insectivorious birds like swallows meant to be the focus. Is an aquatic receptor, not terrestrial; therefore, the response is inappropriate for that particular species.

Comment 7: Is it correct that Sites G, H, I, L, and N in the floodplain?

Additional Issues Arising from New Text/Tables:

Section 5.1.4: Concentrations generated from the industry-specific sampling do not appear to be considered in Table 5-3, Comparison of Maximum Sediment Concentrations to Sediment Quality Guidelines. These data should be considered. In addition, TPH was analyzed, why are the results not presented in Appendix C?

Section 7.2.1: Conclusions that the impaired benthic community is attributable to poor habitat conditions is inappropriate for this section. The benthic community is not discussed in this section and a conclusion regarding their health is not appropriate here. Also, where is the DO data to support the assertion that there is low DO in these areas?

Section 8.4: Since potential risks were identified for some of the terrestrial areas, further evaluation should be recommended.

Appendix F: Body weight adjustments not explained. Why done only for mammals and not for birds? There is a table in the new Appendix F without a title.

Appendix G: Were biota collected from CS-E? If so, why weren't those values used? In addition, if biota had a detection for a chemical, but that chemical was not detected in the surface water and/or sediment, one-half the detection limit should be used to determine a BAF.

Weston Review of
Solutia, Inc.
Responses to Sauget Area 1 HHRA Comments
ENSR
March 2001

Roy F. Weston Inc (WESTON) was retained by the Army Corps of Engineers (ACOE) and the US Environmental Protection Agency (USEPA) to review and provide comments on the *Sauget Area 1 Human Health Risk Assessment Responses to Comments* prepared by ENSR Corporation (March 2001).

In general, the responses to the HHRA review comments were adequate. Specifically, the responses corrected omissions and discrepancies identified in the HHRA, added language to facilitate understanding of certain topics in the HHRA, and added new construction worker evaluations for Areas G, H, I, and L. The only response that we felt was inadequate was **Response to Weston-5** on page 22 of ENSR (March 2001). The original comment was as follows:

> Weston agrees with the approach described in Section 5.6.1.1 regarding calculation of EPCs. However, clarification is necessary regarding the calculation of the 95% UCL for lognormally distributed data. Specifically, the authors stated that the H-statistic values were obtained from Gilbert (1987). For many of the summary statistics reported in the Tables in Appendix B, the numbers of samples used to generate the summary statistics were equal to 2, 4, 6, 8, 9, and 43. However, the H-Statistic Tables in Gilbert (1987) only include H-statistic values for n = 3, 5, 7, 10, 12, 15, 21, 31, 51, and 101. H-statistic values for n other than those presented in the Tables cannot be interpolated linearly. Values are derived using four-point Lagrangian interpolation. The authors need to expand this discussion to explain how H-statistics were interpolated, and include an example to demonstrate the technique.

The main reason that Weston raised that comment was because the procedure described in Gilbert (1987) to calculate the 95% UCL of lognormally distributed data specifically states that H-value statistics for n other than those presented in the Tables cannot be interpolated linearly. Values are derived using four-point Lagrangian interpolation. However, the respondents to Weston-5 clearly indicated that H-statistic values were derived through linear interpolation.

The authors need to explain why they deviated from Gilbert's procedure, and discuss the impact that this deviation should have on the calculated 95% UCL.

Comments regarding the Attachments to the *Sauget Area 1 Human Health Risk Assessment Responses to Comments* follow.

Attachment 1 -

Appendix T - Supplemental Construction Worker Evaluation - The supplemental construction worker evaluation follows the procedure from the HHRA and revised Appendix L of that report. Data used to characterize the risk to construction workers in Sites G, H, I, and L include historical subsurface soil data. Additionally, subsurface TCLP data were used to represent leachate data to characterize risks to construction workers from contact with groundwater within the fill material. No inconsistencies were identified between the maximum values reported in the Ecology & Environment data set and those listed in Table T-3. No discrepancies were identified in the calculation of EPCs for the various components in subsurface soil. It should be noted that most of the EPC values were equal to the maximum concentrations reported in the Ecology & Environment data set. All RfDs and CSFs were confirmed against values reported in IRIS, HEAST, and the latest EPA Region 3 RBC Table. No discrepancies were found. No calculation errors were identified with regard to exposure, risk, and hazard values.

Attachment 2 -

Table Summarizing Workplan Deviations - Table is acceptable.

Attachment 3 -

Revised Appendix J - Evaluation of Ambient Air Monitoring Data - Revisions are acceptable.

Attachment 4 -

Revised Soil to Skin Adherence Factor Tables (5-11 and 5-12) - Revisions are acceptable.

Attachment 5 -

Revised Table 6-2 - Revision is acceptable.

Attachment 6 -

Revised Appendix L Text - Revision is acceptable.

Attachment 7 -

Revised Section 8 - Revision is acceptable.

Attachment 8 -

Appendix B Footnotes - Revision is acceptable.

Attachment 9 -

Revised Table I-3 - Revision is acceptable.

Attachment 10 -

Revised Appendix K Tables - Revisions are acceptable.

Attachment 11 -

Appendix M - Additional Model Output - Addition is acceptable.

Attachment 12 -

Appendix Q Figure and Tables - Additions are acceptable.

Attachment 13 -

Appendix U - Class I Groundwater Screen - Additions are acceptable.

Attachment 14 -

Appendix V - Risk Assessment for Nonpotable Use Residential Wells - Addition is acceptable.

Attachment 15 -

Revised Table 3-7 - Revision is acceptable.

Attachment 16 -

Response to Weston 15(b) - Addition is acceptable.

Attachment 17 -

Insert Locations - Suggested insert locations are acceptable.